

**CLAIMS**

1. A display device (101) for displaying a three dimensional image such that different views are displayed according to the viewing angle, the display device including:
  - 5 a display panel (15, 53) having a plurality of separately addressable pixels (0...10) for displaying said image, the pixels being grouped such that different pixels in a group (16) correspond to different views of the image;
  - 10 a display driver (52) for controlling an optical characteristic of each pixel to generate a grey scale image according to received image data; and
  - 15 a grey scale compensation device (60, 70) for further controlling said optical characteristic of at least some pixels within a group to compensate for a predetermined viewing angle dependency of said optical characteristic.
2. The display device of claim 1 further including a back panel (11) for providing a plurality of discrete sources (14) of illumination, each group (16) of pixels in the display panel (15) being positioned to receive light from a respective one of the discrete sources of illumination.
3. The display device of claim 2 in which the back panel (11) provides a plurality of line sources of illumination.
4. The display device of claim 2 in which the back panel (11) provides a plurality of point sources of illumination.
- 25 5. The display device of claim 2 in which the display panel (15) is a light-transmissive display panel adapted for viewing from a side opposite to the side on which the back panel (11) is located.
- 30 6. The display device of claim 1 further including a lenticular array (120) positioned adjacent to the display panel (115), each lens (121, 122) within the array focusing light from selected pixels in the display panel.

7. The display device of claim 6 in which each lenslet (121, 122) within the array (120) is associated with a said group (16) of pixels.
- 5 8. The display device of any preceding claim in which the optical characteristic is a light transmission characteristic and the display driver (52) and grey scale compensation device (60, 70) are adapted to control the amount of light passing through each pixel according to a grey scale image to be displayed.
- 10 9. The display device of any preceding claim in which the grey scale compensation device (60) comprises a look-up table containing correction values to be applied in respect of each pixel within a group.
- 15 10. The display device of claim 8 in which the correction values are selected according to the viewing angle of a respective pixel within the group (16).
- 20 11. The display device of claim 10 in which the correction values are selected so as to substantially normalise a grey scale intensity displayed by a group of pixels to be independent of the viewing angle.
- 25 12. The display device of claim 9 in which the look-up table includes substitution values or offset values as a function of viewing angle to be applied to a frame store.
- 30 13. The display device of claim 8 in which the grey scale compensation device comprises a transmission versus voltage characteristic, the grey scale compensation device adapted to adjust a pixel drive voltage and/or current received from the display driver.

14. The display device of claim 13 in which the grey scale compensation device provides a voltage and/or current offset to the pixel drive voltage and/or current received from the display driver.
- 5    15. The display device of any preceding claim in which the inherent optical characteristics of the display panel (15, 53) are configured such that viewing angle dependence is reduced or substantially minimised relative to the y-axis and the grey scale compensation device (60, 70) serves to reduce or substantially minimise viewing angle dependence relative to an axis that is  
10    transverse to the y-axis.
16. The display device of claim 15 in which the grey scale compensation device (60, 70) serves to reduce or substantially minimise viewing angle dependence relative to an axis that is orthogonal to the y-axis (i.e. the x-axis).
- 15    17. The display device of claim 16 incorporated into an object, in which the x-axis is defined as the horizontal axis when the object is in normal use, and the y-axis is defined as the vertical axis when the object is in normal use.
- 20    18. A method for displaying a three dimensional image on a display device such that different views of the image are displayed according to the viewing angle, the method comprising the steps of:  
            processing image data to form grey scale pixel data values for each one of a plurality of separately addressable pixels (0...10) in display panel (15, 53),  
25    the pixels being grouped such that different pixels in a group (16) correspond to different views of the image, the pixel data values each for controlling an optical characteristic of a respective pixel to generate a grey scale image;  
            applying grey scale correction values to at least some pixel data values within each group to compensate for a predetermined viewing angle dependency of the optical characteristic; and  
30    using the corrected pixel data values to drive pixels of a display panel to generate said image.

19. The method of claim 18 in which the optical characteristic is a light transmission characteristic and the grey scale correction values applied are adapted to control the amount of light passing through each pixel according to  
5 a three dimensional grey scale image to be displayed.
20. The method of claim 18 in which the grey scale correction values are obtained from a look-up table containing correction values to be applied in respect of each pixel within a group.  
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21. The method of claim 19 in which the correction values are selected according to the viewing angle of a respective pixel within the group (16).
22. The method of claim 21 in which the correction values are selected so  
15 as to substantially normalise a grey scale displayed by a group of pixels to be independent of the viewing angle.
23. The method of claim 19 in which the grey scale correction values are derived from a transmission versus voltage characteristic of the display panel,  
20 the corrected pixel data values being used to adjust a pixel drive voltage and/or current applied to the display panel.
24. The method of any one of claims 18 to 23 further including the step of configuring the inherent optical characteristics of the display panel (15, 53)  
25 such that viewing angle dependence is reduced or substantially minimised relative to the y-axis and applying said grey scale correction values so as to reduce or substantially minimise viewing angle dependence relative to an axis that is transverse to the y-axis.
- 30 25. The method of claim 24 in which the grey scale correction values are applied to reduce or substantially minimise viewing angle dependence relative to an axis that is orthogonal to the y-axis (i.e. the x-axis).

26. The method of claim 25 in which the x-axis is the horizontal axis when the display panel is in normal use, and the y-axis is the vertical axis when the display panel is in normal use.

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27. A computer program product, comprising a computer readable medium having thereon computer program code means adapted, when said program is loaded onto a computer, to make the computer execute the procedure of any one of claims 18 to 26.

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28. A computer program, distributable by electronic data transmission, comprising computer program code means adapted, when said program is loaded onto a computer, to make the computer execute the procedure of any one of claims 18 to 26.

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